

**THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of	
Inventor: Wenxiao HE	: Confirmation No. 7335
U.S. Patent Application No. 10/783,637	: Group Art Unit: 2617
Filed: February 20, 2004	: Examiner: Erika A. Gary
For: METHOD AND APPARATUS FOR REGISTERING A MOBILE NODE WITH A HOME AGENT	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: BOARD OF PATENT APPEALS AND INTERFERENCES

BRIEF ON APPEAL

This brief is in furtherance of the Notice of Appeal, filed in this case on October 26, 2007.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

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I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, L.P., a Texas limited partnership.

II. Related Appeals and Interferences

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. Status of Claims

A. Total Number of Claims in Application

There is a total of 40 claims in the application, which are identified as claims 1-40.

B. Status of all the Claims

Claims 1-40 are pending.

Claims 1-40 are rejected.

C. Claims on Appeal

Claims on appeal are claims 1-40.

IV. Status of Amendments

There are no outstanding un-entered amendments before the Examiner.

V. Summary of Claimed Subject Matter

The present invention relates generally to a method and apparatus for registering a mobile node with a home agent.

Claim 1

Independent claim 1 recites a method for registering a mobile node with a home agent comprising:

determining a home agent (Instant specification in at least paragraphs 11, 13, 14, 19, 20, 24, and 35 and FIG. 1, element 5, FIG. 4, FIG. 5, element 240, FIG. 8, element 420, FIG. 9, element 420);

establishing between the mobile node and the determined home agent a security tunnel having associated with said tunnel a single security association (Instant specification in at least paragraphs 11, 13, 16-18, 21, 25-26, 34, 36-38, 40 and FIG. 1, element 10, FIG. 2, FIG. 4, element 120, FIG. 5, element 245, FIG. 8, element 425, FIG. 9, element 425); and

registering the mobile node with the home agent using the security tunnel (Instant specification in at least paragraphs 11, 13, 19, 20, 22, 24, 30, 36 and FIG. 1, element 15, FIG. 3, FIG. 5, element 210, FIG. 7, element 210, FIG. 9, element 430).

Per the Summary section of the Instant specification, "Registration occurs when a home agent is determined and a security tunnel having a single security association is established between the home agent and the mobile node. The mobile node is then registered [by] the mobile node using the security tunnel."

Claim 9

Independent claim 9 recites a mobile node comprising:

mobile communication interface capable of communicating with a mobile network (Instant specification in at least paragraphs 24, 32, 35, and FIG. 5, element 205, FIG. 8, element 410, FIG. 9, element 410);

home agent determination unit capable of identifying a home agent (Instant specification in at least paragraphs 11, 13, 14, 19, 20, 24, and 35 and FIG. 1, element 5, FIG. 4, FIG. 5, element 240, FIG. 8, element 420, FIG. 9, element 420); security tunneling unit capable of establishing and maintaining a security tunnel between the mobile node and an identified home agent, wherein an established security tunnel uses a single security association descriptor for one or more data paths (Instant specification in at least paragraphs 11, 13, 16-18, 21, 25-26, 34, 36-38, 40 and FIG. 1, element 10, FIG. 2, FIG. 4, element 120, FIG. 5, element 245, FIG. 8, element 425, FIG. 9, element 425); and

registration unit capable of registering the mobile node with an identified home agent using an established security tunnel (Instant specification in at least paragraphs 11, 13, 19, 20, 22, 24, 30, 36 and FIG. 1, element 15, FIG. 3, FIG. 5, element 210, FIG. 7, element 210, FIG. 9, element 430).

Claim 17

Independent claim 17 recites a mobile node comprising:

processor for executing an instruction sequence (Instant specification in at least paragraph 32, and FIG. 8, element 400);

memory for storing an instructions sequence (Instant specification in at least paragraph 32, and FIG. 8, element 405);

mobile communications interface for communicating with a mobile network (Instant specification in at least paragraphs 24, 32, 35, and FIG. 5, element 205, FIG. 8, element 410, FIG. 9, element 410);

instruction sequences stored in the memory including: home agent determination instruction sequence that, when executed by the processor, minimally causes the processor to identify a home agent for the mobile node (Instant specification in at least paragraphs 11, 13, 14, 19, 20, 24, and 35 and FIG. 1, element 5, FIG. 4, FIG. 5, element 240, FIG. 8, element 420, FIG. 9, element 420);

security tunneling instruction sequence that, when executed by the processor, minimally causes the processor to establish a security tunnel from the mobile node to an identified home agent where the security tunnel uses a single security association descriptor to secure a plurality of data paths (Instant specification in at least paragraphs 11, 13, 16-18, 21, 25-26, 34, 36-38, 40 and FIG. 1, element 10, FIG. 2, FIG. 4, element 120, FIG. 5, element 245, FIG. 8, element 425, FIG. 9, element 425); and registry instruction sequence that, when executed by the processor, minimally causes the processor to register the mobile node with an identified home agent using the established security tunnel (Instant specification in at least paragraphs 11, 13, 19, 20, 22, 24, 30, 36 and FIG. 1, element 15, FIG. 3, FIG. 5, element 210, FIG. 7, element 210, FIG. 9, element 430).

Claim 25

Independent claim 25 recites a computer readable medium having imparted thereon instruction sequences for registering a mobile node with a home agent including (Instant specification in at least paragraph 33):

home agent determination instruction sequence that, when executed by a processor, minimally causes the processor to identify a home agent for the mobile node (Instant specification in at least paragraphs 11, 13, 14, 19, 20, 24, and 35 and FIG. 1, element 5, FIG. 4, FIG. 5, element 240, FIG. 8, element 420, FIG. 9, element 420);

security tunneling instruction sequence that, when executed by a processor, minimally causes the processor to establish a security tunnel from the mobile node to an identified home agent where the security tunnel uses a single security association descriptor to secure a plurality of data paths (Instant specification in at least paragraphs 11, 13, 16-18, 21, 25-26, 34, 36-38, 40 and FIG. 1, element 10, FIG. 2, FIG. 4, element 120, FIG. 5, element 245, FIG. 8, element 425, FIG. 9, element 425); and

registry instruction sequence that, when executed by a processor, minimally causes the processor to register the mobile node with an identified home agent (Instant specification in at least paragraphs 11, 13, 19, 20, 22, 24, 30, 36 and FIG. 1, element 15, FIG. 3, FIG. 5, element 210, FIG. 7, element 210, FIG. 9, element 430).

Claim 33

Independent claim 33 recites a mobile node comprising:

means for determining a home agent (Instant specification in at least paragraphs 11, 13, 14, 19, 20, 24, and 35 and FIG. 1, element 5, FIG. 4, FIG. 5, element 240, FIG. 8, element 420, FIG. 9, element 420);

means for establishing a single-security-association based security tunnel between the mobile node and a determined home agent (Instant specification in at least paragraphs 11, 13, 16-18, 21, 25-26, 34, 36-38, 40 and FIG. 1, element 10, FIG. 2, FIG. 4, element 120, FIG. 5, element 245, FIG. 8, element 425, FIG. 9, element 425); and

means for registering the mobile node using an established security tunnel (Instant specification in at least paragraphs 11, 13, 19, 20, 22, 24, 30, 36 and FIG. 1, element 15, FIG. 3, FIG. 5, element 210, FIG. 7, element 210, FIG. 9, element 430).

VI. Grounds of Rejection to be Reviewed on Appeal

A. The issue is whether claims 1, 9, 17, 25, and 33 are unpatentable under 35 U.S.C 102(b) as being anticipated by Yokote (US Patent Application Publication 2002/0157024).

B. The issue is whether claims 1, 9, 17, 25, and 33 are unpatentable under 35 USC 102(e) as being anticipated by Eschbach et al. (US Patent Application Publication 2003/0088765).

C. The issue is whether claims 1, 3-7, 9, 11-15, 17, 19-23, 25, 27-31, 33, and 35-39 are unpatentable under 35 USC 102(e) as being anticipated by Thubert et al. (US Patent Application Publication 2004/0202183).

D. The issue is whether claims 1, 2, 8-10, 16-18, 24-26, 32-34, and 4 are unpatentable under 35 USC 102(b) as being anticipated by Johansson et al. (US Patent Application Publication 2002/0080752).

VII. Argument

A. Was the PTO correct in rejecting claims 1, 9, 17, 25, and 33 under 35 U.S.C. 102(b) as being anticipated by *Yokote*?

The rejection of claims 1, 9, 17, 25, and 33 under 35 USC 102(b) as being anticipated by *Yokote* is incorrect and hereby traversed. A rejection based on 35 U.S.C. §102 requires every element of the claim to be included in the reference, either directly or inherently. Claim 1 is patentable over *Yokote* because the reference fails to disclose or suggest every element of claim 1.

Claim 1

Yokote fails to disclose or suggest "registering the mobile node with the home agent using the security tunnel" as claimed in claim 1.

In response to Appellant's arguments submitted July 9, 2007, the PTO asserts that "the reference teaches that during a registration process, the home agent and mobile node negotiate for a security association that is used for *subsequent* communications." PTO Final Official Action (FOA) mailed August 27, 2007 at page 5, section 6. As set forth below, this is incorrect based on the plain language of *Yokote*. Further, the cited language does not appear to state that the subsequent communications comprises the registration of a mobile node with a home agent, rather the language states that during a registration process a security association is negotiated.

Further, the PTO attempts to rely on paragraphs 49 and 54 of *Yokote* to buttress the argument; however, this is incorrect because neither paragraph states that registration occurs using the security tunnel. The PTO-identified portions of *Yokote*, reproduced herein for ease of reference and convenience, states as follows:

Among various security procedures and protocols, a security association (SA) is fundamental to implementation of IPsec. An SA is a relationship between two nodes that describes security services that the nodes agree to use in order to communicate securely between them. Prior to the exchange of information between nodes, the nodes negotiate and

establish a the SA between the nodes. Each node, then stores that SA, for a discrete lifetime of the SA.

Yokote at paragraph 49

When a communication between nodes is first initiated, it is desirable to first establish an SA to ensure security in the exchange of data packets exchange between the nodes. When the nodes have had a prior communication an SA has been established and stored in the cache for each node. That stored SA can be re-used for future communications and avoid delays manifested in establishing the SA, thereby reducing latency in the communication between the nodes.

Yokote at paragraph 54

Read in context, paragraphs 49 and 54 appear to restate what a security association is and how the SA is established **without** describing that registration occurs using the established security tunnel. That is, paragraphs 49 and 54 appear to be a focused description of security associations between two nodes without describing the registration process. As set forth below, *Yokote* appears to state that the registration occurs prior to establishment of the security tunnel and neither paragraphs 49 or 54 negate the prior *Yokote* description. For at least this reason, reversal of the rejection is respectfully requested.

With respect to *Yokote* at paragraph 13, the PTO asserts that *Yokote* describes registering the mobile node with the home agent using the security tunnel. This is incorrect. *Yokote* describes the mobile node as registering with the home agent prior to the tunnel being established. *Yokote* at paragraph 13. The PTO-identified portion of *Yokote*, reproduced herein for ease of reference and convenience, states as follows:

IPsec is applicable in both Mobile IPv4 and Mobile IPv6 environments. For instance, during a registration process in Mobile IPv4 in which a mobile node situated away from home is registering its care-of address with its home agent, the home agent and the mobile node negotiate for a mutually agreeable SA and establish an encryption key that is to be used to protect subsequent communications being tunneled between them. Similarly, the above IPsec is implemented in the Route Optimization operations according to Mobile IPv6. A mobile node situated away from home sends a binding update to a correspondent node to notify the

mobile node's current point of attachment to the Internet. The mobile and correspondent nodes then negotiate for a mutually agreeable SA and determine a cryptographic key that is to be used to protect subsequent communications routed directly between them. Ipsec provides for the creation of more than one SA having different security policies, between two nodes. The SA's are uniquely identified by a Security Parameter Index (SPI), which for example may be a 32 bit integer.

Yokote at paragraph 13 (emphasis added)

The PTO-identified portion of *Yokote* appears to describe registration occurring prior to establishment of the security tunnel which is contrary to the feature claimed in claim 1. That is, *Yokote* states that the mobile node notifies the home of the current point of attachment and "then negotiate for a mutually agreeable" security association." Plainly, *Yokote* describes the registration occurring prior to establishment of the security association and, inter alia, a security tunnel. For at least this reason, reversal of the rejection is respectfully requested.

Based on at least the foregoing reasons, claim 1 is patentable over *Yokote* and reversal of the rejection is respectfully requested.

Claims 9, 17, 25, and 33 are patentable over *Yokote* for at least reasons similar to those advanced above with respect to claim 1 and reversal of the rejection is respectfully requested.

B. Was the PTO correct in rejecting claims 1, 9, 17, 25, and 33 under 35 U.S.C. 102(e) as being anticipated by *Eschbach*?

Claim 1

The rejection of claims 1, 9, 17, 25, and 33 under 35 USC 102(e) as being anticipated by *Eschbach* is hereby traversed. A rejection based on 35 U.S.C. §102 requires every element of the claim to be included in the reference, either directly or inherently. Claim 1 is patentable over *Eschbach* because the reference fails to disclose or suggest every element of claim 1.

At the outset, Appellant notes that the PTO has asserted a new ground of rejection based on *Eschbach* which was neither necessitated by Appellant's amendments nor by an information disclosure statement submitted by Appellant. Withdrawal of the finality of the Official Action and/or the rejection based on *Eschbach* is respectfully requested in addition to reversal of the rejection as set forth below.

Claim 1

The PTO attempts to rely on paragraph 30 of *Eschbach* for the assertion that the subject matter of claim 1 is anticipated by the reference. This is incorrect.

First, *Eschbach* appears to describe a process for enabling session inter-device (SID) mobility and not registering a mobile node with a home agent as claimed. SID mobility, as described by *Eschbach* at paragraph 30, enables the transfer of a session from one device to another device. Paragraph 30 fails to disclose establishing a security tunnel between the mobile node and the home agent prior to registering the mobile node with the home agent. Rather, paragraph 29 explicitly states that the home agent "only accepts registration requests from a mobile device 12 which the [home agent] 18 can authenticate as originating from a legitimately relocated mobile device." That is, the mobile device registration occurs prior to establishment of a security tunnel and without using the security tunnel. For at least this reason, reversal of the rejection is respectfully requested.

Further, as described by *Eschbach* at paragraphs 31-33, a transferring node registers a target node with the agent prior to establishment of the security association between the agent and the target node. *Eschbach* states that the transfer request (which does not occur over an as-yet-to-be-established security tunnel between the agent and target node) contains "the Target Node's IP address" and security association information to enable subsequent establishment of a security association as between the Agent and the Target Node. Thus, *Eschbach* fails to disclose the claimed subject matter of claim 1. For at least this reason, reversal of the rejection is respectfully requested.

C. Was the PTO correct in rejecting claims 1, 3-7, 9, 11-15, 17, 19-23, 25, 27-31, 33, and 35-39 under 35 U.S.C. 102(e) as being anticipated by *Thubert*?

The rejection of claims 1, 3-7, 9, 11-15, 17, 19-23, 25, 27-31, 33, and 35-39 under 35 USC 102(e) as being anticipated by *Thubert* is hereby traversed. A rejection based on 35 U.S.C. §102 requires every element of the claim to be included in the reference, either directly or inherently. Claim 1 is patentable over *Thubert* because the reference fails to disclose or suggest every element of claim 1.

Claim 1

Thubert fails to disclose or suggest “establishing between the mobile node and the determined home agent a security tunnel” as claimed in claim 1.

In response to Appellant’s arguments submitted July 9, 2007, the PTO asserts that “*Thubert* teaches that the mobile node registers via a tunnel terminated by the home agent.” PTO Final Official Action (FOA) mailed August 27, 2007 at page 6, section 6. As set forth below, this is incorrect based on the plain language of *Thubert*.

The PTO attempts to rely on paragraph 48 for the above assertion; however, this is incorrect. Presumably the PTO is attempting to rely on the sentence fragment which states “mobile router 12 registers via the bidirectional tunnel 15a terminated by the home agent (HA) 18.” *Thubert* at paragraph 48. Again, the PTO appears to be reading the statement out of context. In context, paragraphs 47-56 appear to describe FIG. 4A which depict a “method by the mobile router 12 and the correspondent router 13b of optimizing routing paths based on establishment of the bidirectional tunnel 15d.” *Thubert* at paragraph 47. That is, the registration described appears to be as between the mobile router and the correspondent router prior to establishment of a security association between the mobile and correspondent routers. Because the mobile router appears to have already registered and established a security association with the home agent, the registration communication with the correspondent router occurs (for at least the portion of the connectivity between the correspondent router and the mobile router which corresponds to the connection

between the mobile router and the home agent) via the established security association between the mobile router and the home agent. This is inapplicable because: (a) the registration described appears to occur as between the mobile and correspondent routers and not between the mobile router and the home agent; and (b) the registration occurs prior to establishment of the security association between the mobile router and the correspondent node. For at least this reason, reversal of the rejection is respectfully requested.

Further, as described below, the description of *Thubert* appears to be concerned with communication between a mobile router and a correspondent node.

The PTO asserts that *Thubert* describes establishing a security tunnel as claimed at the Abstract and paragraphs 6, 15, 39, and 48. This is incorrect. Each of the PTO-identified portions of *Thubert* appear to describe establishing a tunnel between a mobile router and a correspondent node and not establishing a security tunnel between a mobile node and a home agent. The Title of *Thubert* is "Arrangement for Establishing a Bidirectional Tunnel Between a Mobile Router and a Correspondent Node." (Emphasis added) There does not appear to be a disclosure of establishing a security tunnel between a mobile node and a home agent, nor does there appear to be a disclosure of registering the mobile node with the home agent using the security tunnel as claimed in claim 1. For at least this reason, reversal of the rejection is respectfully requested.

Based on at least the foregoing reasons, claim 1 is patentable over *Thubert* and reversal of the rejection is respectfully requested.

Claims 3-7 depend, either directly or indirectly, from claim 1, include further limitations, and are patentable over *Thubert* for at least the reasons advanced above with respect to claim 1. The rejection of claims 3-7 should be reversed.

Claims 9, 17, 25, and 33 are patentable over *Thubert* for at least reasons similar to those advanced above with respect to claim 1 and reversal of the rejection is respectfully requested.

Claims 11-15, 19-23, 27-31, and 35-39 depend, either directly or indirectly, from claims 9, 17, 25, and 33, include further features, and are patentable over *Thubert* for at least reasons similar to the reasons advanced above with respect to claim 1. The rejection of claims 11-15, 19-23, 27-31, and 35-39 should be reversed.

D. Was the PTO correct in rejecting claims 1, 2, 8-10, 16-18, 24-26, 32-34, and 40 under 35 U.S.C. 102(e) as being anticipated by *Johansson*?

The rejection of claims 1, 2, 8-10, 16-18, 24-26, 32-34, and 40 under 35 USC 102(b) as being anticipated by *Johansson* is hereby traversed. A rejection based on 35 U.S.C. §102 requires every element of the claim to be included in the reference, either directly or inherently. Claim 1 is patentable over *Johansson* because the reference fails to disclose or suggest every element of claim 1.

Claim 1

Johansson fails to disclose or suggest "registering the mobile node with the home agent using the security tunnel" as claimed in claim 1.

In response to Appellant's arguments submitted July 9, 2007, the PTO asserts that "*Johansson* teaches the mobile sends a registration message along with tunnel information. **Subsequently**, a security association with the home agent is established for traffic sent back [paragraph 0114]. Hence, the security tunnel is established before the registration is complete." PTO Final Official Action (FOA) mailed August 27, 2007 at page 6, section 6 (emphasis added). As set forth below, this is incorrect based on the plain language of *Johansson* and fails to anticipate the claimed subject matter.

The PTO appears to be asserting without any support in any of the applied references that registration is not complete until traffic is sent back from the home agent to the mobile node. Without any support for this asserted definition, reversal of the rejection is respectfully requested because *Johansson* appears to consider registration of the mobile node with the home agent as occurring upon transmission of a registration message from the mobile node to the home agent. The claim language states "registering the mobile node with the home agent using the security tunnel" and the PTO admits that the registration from the mobile node to the home agent occurs prior to establishment of the security tunnel, i.e., reference is made to the above copied quotation stating that the security association is established subsequent to the registration message transmission. Thus, according to *Johansson* and the PTO's admission, registration of the mobile node with the home agent occurs prior to

establishment of the security tunnel and *Johannson* fails to anticipate the claimed subject matter. Based on at least the foregoing, reversal of the rejection is respectfully requested.

Further, the PTO asserts without support in *Johansson* that registration is completed via use of an established security tunnel. *Johansson* fails to so state. *Johansson* also fails to state that the security tunnel is established prior to completion of the registration. For at least this additional reason, reversal of the rejection is respectfully requested.

Further, the PTO asserts that *Johansson* describes registering the mobile node with the home agent using the security tunnel at paragraphs 114, 126, and 138. This is incorrect. *Johansson* appears to describe the mobile node as registering with the home agent prior to the tunnel being established. *Johansson* at paragraph 114 ("sends a mobile IP 27 registration message to the selected network interface card 88" followed by "instructs the IPSec filter 84a via the security association database 84d to utilize security associations").

Further, *Johansson* appears to describe modification of mobile IP tunnel 30a after receipt of registration request 93, which does not appear to have traversed the tunnel. *Johansson* at paragraph 126 ("The mobile IP tunnel 30a is then modified to contain a UDP header 30c as well."). Paragraph 138 of *Johansson* appears to describe the transmission of "registration request 93 towards the home agent 1" without disclosing that transmission of the registration occurs using the security tunnel. Further still, paragraphs 139-141 of *Johansson* appear to describe the communication of registration information between a mobile node and its home agent without the use of a security tunnel. For at least this reason, reversal of the rejection is respectfully requested.

The PTO-identified portion of *Johansson* appears to describe registration occurring prior to establishment of the security tunnel which is contrary to the feature claimed in claim 1. For at least this reason, reversal of the rejection is respectfully requested.

Based on at least the foregoing reasons, claim 1 is patentable over *Johansson* and reversal of the rejection is respectfully requested.

Claim 2 depends, either directly or indirectly, from claim 1, include further limitations, and are patentable over *Johansson* for at least the reasons advanced above with respect to claim 1. The rejection of claim 2 should be reversed.

Claims 9, 17, 25, and 33 are patentable over *Johansson* for at least reasons similar to those advanced above with respect to claim 1 and reversal of the rejection is respectfully requested.

Claims 8, 10, 16, 18, 24, 26, 32, 34, and 40 depend, either directly or indirectly, from claims 9, 17, 25, and 33, include further features, and are patentable over *Johansson* for at least reasons similar to the reasons advanced above with respect to claim 1. The rejection of claims 8, 10, 16, 18, 24, 26, 32, 34, and 40 should be reversed.

VIII. Conclusion

Each of the PTO's rejections has been traversed. Appellant respectfully submits that all claims on appeal are considered patentable over the applied art of record. Accordingly, reversal of the PTO's Final Rejection is believed appropriate and courteously solicited.

If for any reason this Appeal Brief is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned, Appellant's attorney of record.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 08-2025 and please credit any excess fees to such deposit account.

Reversal of the rejection is in order.

Respectfully submitted,
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IX. Claims Appendix

1. A method for registering a mobile node with a home agent comprising:
determining a home agent;
establishing between the mobile node and the determined home agent a security tunnel having associated with said tunnel a single security association; and
registering the mobile node with the home agent using the security tunnel.
2. The method of claim 1 wherein establishing a security tunnel comprises:
creating a security policy database for at least one of a binding update message, a return routability message, prefix discovery message and payload data packet; and
associating two or more security policy databases with a security tunnel using a single security association.
3. The method of claim 1 wherein registering the mobile node with the home agent comprises:
dispatching a binding update request to the home agent using the security tunnel; and
receiving a binding update acknowledgement by way of a reverse path security tunnel.

4. The method of claim 1 further comprising discovering an applicable prefix for the home agent using the security tunnel.
5. The method of claim 1 further comprising conveying data to a correspondent node using the security tunnel.
6. The method of claim 1 further comprising communicating a return routability signal to the home agent using the security tunnel.
7. The method of claim 1 further comprising establishing a reverse path security tunnel having associated with said tunnel a single security association.
8. The method of claim 7 wherein establishing a reverse path security tunnel comprises creating a security policy database for at least one of a binding update message, a return routability message, prefix discovery message and payload data packet; and associating one or more security policy databases with a security tunnel using a single security association.
9. A mobile node comprising:
 - mobile communication interface capable of communicating with a mobile network;
 - home agent determination unit capable of identifying a home agent; security tunneling unit capable of establishing and maintaining a security tunnel between the

mobile node and an identified home agent, wherein an established security tunnel uses a single security association descriptor for one or more data paths; and

registration unit capable of registering the mobile node with an identified home agent using an established security tunnel.

10. The mobile node of claim 9 wherein the security tunnel unit comprises:

security association descriptor capable of storing a security association;

security policy descriptor capable of storing a security policy for at least one of a binding update message, a return routability message, a prefix discovery solicitation message and a payload data packet;

messaging unit capable of formatting a secure message according to an incoming message that includes at least one of a binding update message, a return routability message, a prefix discovery message and a payload data packet and according to a security association stored in the security association descriptor and further capable of formatting a secure message using a security policy stored in any of the security policy descriptors, wherein the security policy descriptor is selected according to the type of the incoming message.

11. The mobile node of claim 9 wherein the registration unit comprises:

binding request message unit that directs to the security tunneling unit a binding message directed to a home agent according to an indicator received from the home agent determination unit; and

binding acknowledgement unit that receives a binding update acknowledgement from the security tunneling unit according to a tunneling packet received from the home agent using a reverse path security tunnel.

12. The mobile node of claim 9 further comprising a prefix discovery unit capable of discovering an applicable prefix for the determined home agent using the established security tunnel.

13. The mobile node of claim 9 further comprising a payload unit capable of accepting data from a client and directing it to the security tunneling unit.

14. The mobile node of claim 9 further comprising route discovery unit capable of dispatching a return routability message to the security tunneling unit.

15. The mobile node of claim 9 wherein the security tunneling unit is capable of establishing and maintaining a reverse path security tunnel between the mobile node and an identified home agent.

16. The mobile node of claim 15 wherein the security tunneling unit comprises: reverse path security association descriptor capable of storing a security association; reverse path security policy descriptor capable of storing a security policy for at least one of a binding update acknowledgement message, a return routability reply message, a prefix discovery advertisement message and a return payload data packet

wherein the messaging unit is capable of unsecuring a secure tunneling message according to a security association stored in the reverse path security association descriptor and according to a security descriptor stored in at least one of the reverse path security policy descriptors wherein the reverse path security policy descriptor is selected according to the type of secure tunneling message received.

17. A mobile node comprising:

processor for executing an instruction sequence;

memory for storing an instructions sequence;

mobile communications interface for communicating with a mobile network;

instruction sequences stored in the memory including: home agent determination instruction sequence that, when executed by the processor, minimally causes the processor to identify a home agent for the mobile node;

security tunneling instruction sequence that, when executed by the processor, minimally causes the processor to establish a security tunnel from the mobile node to an identified home agent where the security tunnel uses a single security association descriptor to secure a plurality of data paths; and registry instruction sequence that, when executed by the processor, minimally causes the processor to register the mobile node with an identified home agent using the established security tunnel.

18. The mobile node of claim 17 wherein the security tunneling instruction sequence causes the processor to establish a security tunnel by minimally causing the processor to create a single security association that can be used by a plurality of data

paths, including, but not limited to data paths for a binding update message, a return routability message, a prefix discovery message and a payload data packet.

19. The mobile node of claim 17 wherein the registry instruction sequence causes the processor to register the mobile node by minimally causing the processor to dispatch a binding update request to an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

20. The mobile node of claim 17 further comprising a prefix discovery instruction sequence that, when executed by the processor, minimally causes the processor to discover a prefix for an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

21. The mobile node of claim 17 further comprising a payload instruction sequence that, when executed by the processor, minimally causes the processor to direct a payload data packet to an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

22. The mobile node of claim 17 further comprising a return path verification instruction sequence that, when executed by the processor, minimally causes the processor to direct a return routability message to an identified home agent using a

security tunnel established by the processor when it executes the security tunneling instruction sequence.

23. The mobile node of claim 17 wherein the security tunneling instruction sequence further minimally causes the processor to establish a reverse path security tunnel capable of carrying a plurality of data paths using a single security association.

24. The mobile node of claim 23 wherein the security tunneling instruction sequence, when executed by the processor, minimally causes the processor to establish a reverse path security tunnel by: creating a security policy database for at least one of a binding update message, a return routability message, prefix discovery message and payload data packet; and associating one or more security policy databases with a reverse path security tunnel using a single security association.

25. A computer readable medium having imparted thereon instruction sequences for registering a mobile node with a home agent including:

home agent determination instruction sequence that, when executed by a processor, minimally causes the processor to identify a home agent for the mobile node;

security tunneling instruction sequence that, when executed by a processor, minimally causes the processor to establish a security tunnel from the mobile node to an identified home agent where the security tunnel uses a single security association descriptor to secure a plurality of data paths; and

registry instruction sequence that, when executed by a processor, minimally causes the processor to register the mobile node with an identified home agent.

26. The computer readable medium of claim 25 wherein the security tunneling instruction sequence causes a processor to establish a security tunnel by minimally causing the processor to create a single security association that can be used by a plurality of data paths, including, but not limited to data paths for a binding update message, a return routability message, a prefix discovery message and a payload data packet.

27. The computer readable medium of claim 25 wherein the registry instruction sequence causes the processor to register the mobile node by minimally causing the processor to dispatch a binding update request to an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

28. The computer readable medium of claim 25 further comprising a prefix discovery instruction sequence that, when executed by the processor, minimally causes the processor to discover prefix for an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

29. The computer readable medium of claim 25 further comprising a payload instruction sequence that, when executed by the processor, minimally causes the processor to direct a payload data packet to an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

30. The computer readable medium of claim 25 further comprising a return path verification instruction sequence that, when executed by the processor, minimally causes the processor to direct a return routability message to an identified home agent using a security tunnel established by the processor when it executes the security tunneling instruction sequence.

31. The computer readable medium of claim 25 wherein the security tunneling instruction sequence further minimally causes the processor to establish a reverse path security tunnel capable of carrying a plurality of data paths using a single security association.

32. The computer readable medium of claim 31 wherein the security tunneling instruction sequence, when executed by the processor, minimally causes the processor to establish a reverse path security tunnel by: creating a security policy database for at least one of a binding update message, a return routability message, prefix discovery message and payload data packet; and associating one or more

security policy databases with a reverse path security tunnel using a single security association.

33. A mobile node comprising: means for determining a home agent; means for establishing a single-security-association based security tunnel between the mobile node and a determined home agent; and means for registering the mobile node using an established security tunnel.

34. The apparatus of claim 33 wherein the means for establishing a single-security association based security tunnel comprises means for associating a plurality of security policy databases with a single security association.

35. The apparatus of claim 33 wherein the means for registering the mobile node comprises: means for dispatching a binding update message to an identified home agent using an established security tunnel; and means for receiving a binding update acknowledgement by way of a reverse path security tunnel.

36. The apparatus of claim 33 further comprising a means for discovering an applicable prefix for the home agent using an established security tunnel.

37. The apparatus of claim 33 further comprising a means for conveying data to a correspondent node using an established security tunnel.

38. The apparatus of claim 33 further comprising a means for communicating a return routability signal to a determined home agent using an established security tunnel.

39. The apparatus of claim 33 further comprising a means for establishing a reverse path single-security-association based security tunnel.

40. The apparatus of claim 39 wherein the means for establishing a reverse path security tunnel comprises means for associating a plurality of security policy databases with a single security association.

X. Evidence Appendix

None.

XI. Related Proceedings Appendix

None.